

LOOKING FOR SIGNATURES OF BLACK HOLE MIMICKERS WITH THE EVENT HORIZON TELESCOPE

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The Event Horizon Telescope (EHT) presents an important opportunity to look for signatures of black hole mimickers in the supermassive black hole candidates at the cores of our galaxy and the nearby galaxy M87. We study the features observable by the EHT that could enable us to distinguish two distinct classes of black hole mimickers from accreting Kerr black holes. Specifically, we consider models of gravastars and boson stars, as representatives of regular black hole mimickers with and without a surface. We employ general-relativistic magnetohydrodynamics simulations of accretion onto these objects and general-relativistic radiative transfer calculations to generate synthetic observables that take into account realistic EHT array configurations and image reconstruction, and which can be contrasted with actual observations. These include horizon-scale strong field images and complementary information such as lightcurves and spectra. The alternative models we studied show significant differences with respect to the expectations derived from Kerr black hole models, demonstrating the potential of EHT observations to constrain the parameter space of black hole mimickers as models for supermassive black hole candidates.